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ABSTRACT

An organized approach to the assessment of the present and anticipated training needs of local business and industry is presented for two-year colleges with an occupational education orientation. The manual first presents a rationale for and a definition of employer needs assessments. Next the requirements for raw and relative data are discussed, as are the kinds of information that can be obtained from representatives from business and industry, community leaders, students and alumni, and faculty and staff. The manual then considers the planning and implementation of employer needs assessments in terms of: (1) determination of the specific purposes of the research project, e.g., identification of the training needs of local employers, of the employment trends in the area, and of the occupational skill level to be attained by graduates; (2) the steps of an employer needs assessment; (3) methodological practices that assure that those surveyed are representative of the whole employer population; (4) random sampling and stratification of samples; (5) data-gathering instruments and the usefulness of mailed questionnaires and structured and unstructured questions; (6) selection and training of interviewers; and (7) quantification and organization of data. The text includes sample structured questions, a bibliography, and an Occupational Inventory Checklist from the Tri-County Technical College Assessment Project. (JP)

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THE CONDUCT OF NEEDS ASSESSMENTS AMONG EMPLOYERS:

A Manual of Techniques and Interpretations for Business/Industry Surveys

by

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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EMPLOYER NEEDS ASSESSMENTS: TECHNIQUES AND INTERPRETATIONS

A Manual for the Conduct of Business-Industry Surveys

1. WHY CONDUCT AN EMPLOYER NEEDS ASSESSMENT?

Officials in vocational training centers, technical colleges and other kinds of occupational-oriented training institutions regularly make decisions related to the occupational needs and training expectations of local businesses, industries, and other agencies. These decisions should be based upon current, accurate information. If decision-making personnel in institutions that provide trained, skilled manpower for jobs are not aware of current local needs of employers--as well as those of employees who eventually expect to enter the job market--serious problems can develop, among which might be any one or a combination of the following: 1) undertraining or overtraining of persons for various occupational categories within the service area, 2) the production of too many or too few trained personnel in selected occupations, 3) the failure to meet actual demands for selected trained personnel to fill jobs in the service area, 4) the inadequate or improper training of future employees, or 5) a breakdown in communications among business/industry and local educational institutions.

Coupled with the need for <u>current</u> information for use in making appropriate educational decisions is the often-expressed desire for projections of <u>future</u> needs, insofar as such needs can be determined. Thus, technical colleges, vocational education centers, junior colleges, and other institutions that offer vocational/technical training must have access to current data—e.g., "market information"--for use in the planning and implementation of effective manpower training programs. Furthermore, whenever manpower skill shortages exist,

vocational and technical educational institutions are in an advantageous position to respond to requests for specialized occupational training.

2. WHAT IS AN EMPLOYER NEEDS ASSESSMENT?

An employer needs assessment is an organized, methodological approach to the generation of relevant knowledge about various economic dimensions of a community, particularly those questions that concern the training needs for employment within local business and industries. These assessments are also designed to answer many of the following types of questions:

1) What is the nature of the local business and industrial community--types of plants, products, services, etc.?

2) What linkages exist between local manpower and the business/industrial community? (e.g., Why are certain businesses located in the service area?)

3) Are the requirements for trained manpower being met within the service area?

4) What are local employment/occupational trends?

5) What expansions, curtailments, or periods of "no growth" are anticipated in the future by business and industry? How will these developments affect the local job market?

6) With respect to vocational and technical training for jobs, are the objectives of educational institution being achieved.

7) To what extent are educational institutions actually serving the business and industrial community?

8) How aware of local vocational/technical training programs are representatives of the business and industrial community?

9) Within the service area, do unique vocational/technical education needs exist for which no educational opportunities have been established at local training centers?

10) Are there aspects of locally-provided vocational/technical training that are perceived as weak and in need of improvement?

Most employer needs assessments are conducted to accomplish one or more of the following objectives:

1) to determine how an educational institution can improve the match between the abilities of students, the requirements and objectives of the curriculum, and the range of technical job availability within a selected geographical region--e.g., in the institution's service area;

2) to determine whether there is a demand for new or improved curricular programs at technical or vocational education institutions;

3) to determine whether predictions and forecasts of changing manpower needs within certain technical or vocational occupational categories have implications for the modification of existing educational programs or for the initiation of new programs;

4) to obtain information that will allow a vocational or technical educational institution to plan their curricula, based upon local realistic manpower needs;

5) to obtain information that will allow the making of improvements, insofar as educational equipment and physical facilities are concerned;

6) to obtain information that will facilitate more realistic planning for staff resources necessary for the development of new educational programs;

7) to collect data that will allow an institution to account for the expenditure of public funds for programs of occupational/technical education;

8) to obtain information for use in making projections of the number and kinds of jobs that will be available in an institution's service area--that is, jobs for which an institution can provide training; and

9) to collect job market data for use in immediate and long-range institutional planning.

Educational institutions are affected by many environmental changes, among which are the following factors: 1) increases or decreases in student enrollment, 2) the growth or decline of the population served, 3) levels of accountability expected by supporting and controlling agencies or authorities, 4) the degree of career consciousness among people in the service area, 5) changes in the number of college-age members of the population, 6) the extent to which planning and management of higher education is centralized at local and state levels, 7) the extent to which the service area is industrialized, 8) the degree of variety among local industries, and 9) the general

level of technological development within the service area.

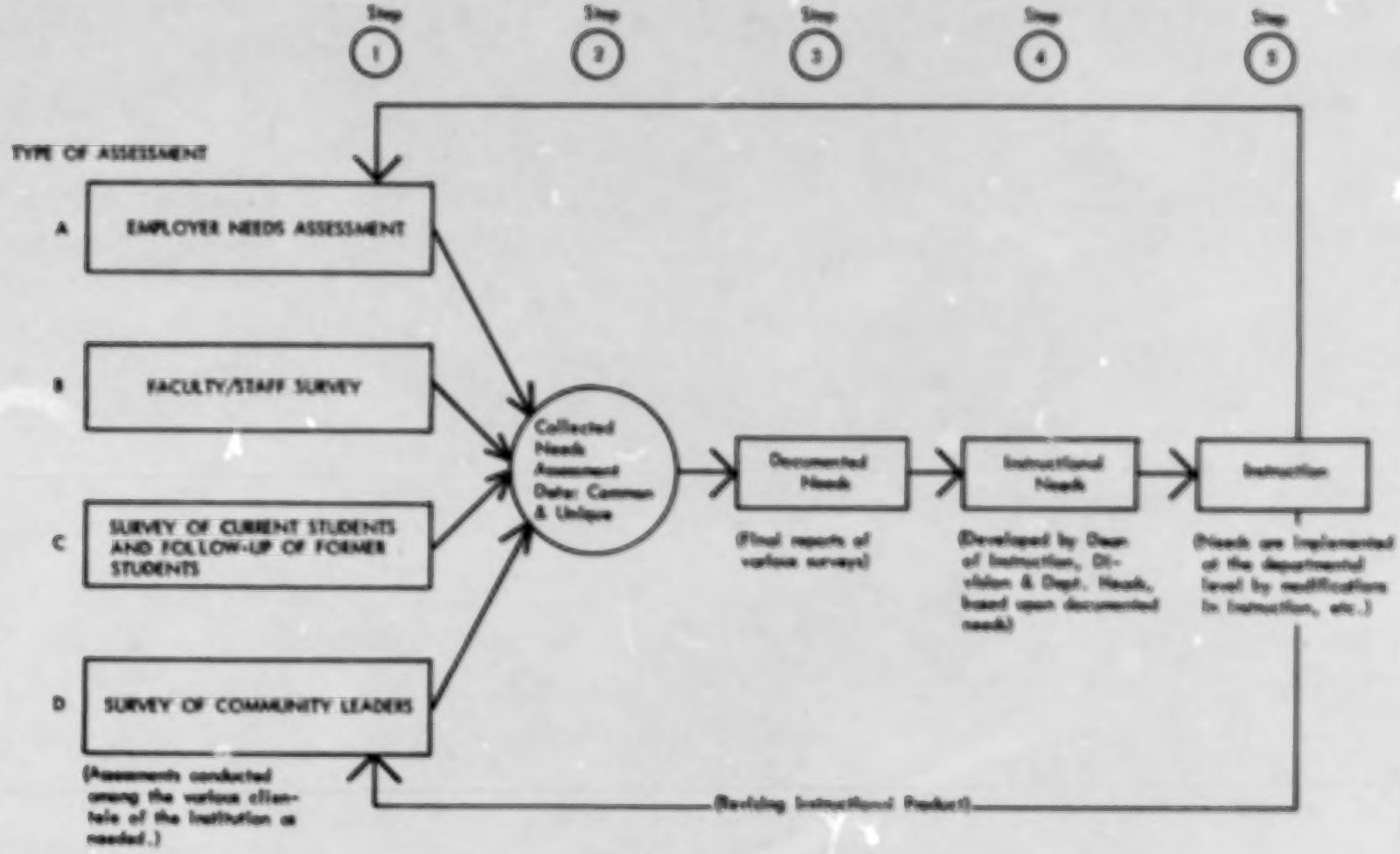
Many of these variables are related--in one way or another--to the kind of available occupational training, particularly within technical education centers and vocational schools. In assessing needs, the determination of the nature of the environment and the pertinent variables are involved. During periods of rapid growth, the continual monitoring of the community becomes especially important so that educational institutions can respond to trends, innovations, expansions, etc., within the community served.

Many needs assessments involve evaluations of the extent to which established educational programs meet the needs of students and industry in a service area. A survey of the business/industry community provides a formal mechanism for the systematic involvement of appropriate elements of the community in the establishment of educational priorities for occupational training programs. Needs assessments allow the identification of discrepancies between educational needs and local educational programs/services that are presumably addressed to those needs. For example, valuable collected opinions and attitudes of clientele in the service area might be used to modify and strengthen institutional goals and educational programs. Another "spinoff", so to speak, of some needs assessment projects is the establishment of direct, personal communication links among employing organizations so that information about occupational needs and training capabilities can be exchanged.

The results ("output") of many occupational surveys--of which the employer needs assessment is a typical example--were categorized as follows by Belle Ruth Witkin in the November 1977 issue of Educational Technology (17:12)

1. "Ranking of the community's educational needs in order of importance.
2. Development of alternative plans to meet those needs.
3. Guidelines for budget allocations according to need priorities.
4. Determination of economic feasibility of fulfilling the need--cost/utility analysis.

SUGGESTED NEEDS ASSESSMENT PROCESS


Step 1
Step 2
Step 3
Step 4
Step 5
TYPE OF ASSESSMENT
A
EMPLOYER NEEDS ASSESSMENT
B
FACULTY/STAFF SURVEY
C
SURVEY OF CURRENT STUDENTS AND FOLLOW-UP OF FORMER STUDENTS
D
SURVEY OF COMMUNITY LEADERS
(Assessments conducted among the various clientele of the institution as needed.)
Collected Needs Assessment Data: Common & Unique
Documented Needs
(Final reports of various surveys)
Instructional Needs
(Developed by Dean of Instruction, Division & Dept. Heads, based upon documented needs)
Instruction
(Needs are implemented at the departmental level by modifications in instruction, etc.)
(Revising Instructional Product)

3. Development of a continuing, dynamic system to evaluate the educational system's effectiveness in meeting community needs."

In addition to the general employer needs assessment, narrowly focused assessments may also be conducted among specific clientele of the community. For example, an employer survey could be carried out in the health technologies to evaluate the job market and training needs for such occupations as registered nurses, dental assistants, medical lab technicians, physical therapists, etc. Another survey might be conducted among such communication agencies as radio and television stations, newspapers, and other information dissimination services.

3. DATA ELEMENTS OF NEEDS ASSESSMENTS

Among other types of information, the following are data elements that are often sought in employer needs assessments:

- Number and type of unfilled jobs in business/industry.
- Number of permanent positions in business/industry.
- Number of estimated positions expected by a given future period, i.e., three years, five years, etc.
- Turnover rates for various occupational categories (from Employer Security Commission).
- Attitudes about local vocational/technical education programs.
- Recorded data from government documents, reference resources, and other printed materials (e.g., employment trends, business-industrial indicators, population characteristics and trends, economic trends and predictions, etc.).
- Attitudes toward and treatment of women actually employed or seeking employment in business/industry.
- Feedback on quality of instruction/training.
- Information on new trends and development within business/industry.

Kinds of Data Needed From Respondents in Various Types of Assessments

Business and Industry

1. Effectiveness of VOC/TEC educational program.
2. Current general occupational needs--on-going and predicted.
3. Current skills needed--basic and specialized; now as opposed to immediate future, etc.

4. Impact of VOC/TEC on business and industry in the service area.
5. Employer awareness of specific program content.
6. Indicators of future general and specific occupational trends.
7. General and specific suggestions and recommendations.
8. Jobs now filled by over-qualified and/or under-qualified employees.
9. Current training needs.
10. Data about employees who hold 2-year degrees.
11. Occupations which employees believe to be emerging or that will soon be phased out.

● Community leaders

1. Image of VOC/TEC--favorable, neutral, unfavorable.
2. Impact of VOC/TEC on service area--general and specific.
3. External perceptions of the quality of VOC/TEC's programs.
4. Degree of public awareness of VOC/TEC's educational role and mission.
5. Degree of community satisfaction/dissatisfaction with VOC/TEC in general.
6. Degree of community satisfaction/dissatisfaction with VOC/TEC programs in particular.
7. Attitudes toward vocational and technical education.
8. Public awareness of vocational and technical training.
9. General and specific suggestions.
10. Indicators of the degree of community use of services or resources of the institution.
11. Indicators of effectiveness of public relations programs.
12. Indicators of need for or interest in continuing education.
13. Indicators of transportation needs so that citizens can get to and from the institution.
14. Indicators of the ways the institution can be more responsive to the educational needs of the community.

● TEC Students and Alumni

1. Effectiveness of various VOC/TEC educational programs (from alumni).
2. Degree of current satisfaction/dissatisfaction with VOC/TEC in general.
3. Degree of current satisfaction/dissatisfaction with VOC/TEC in particular.
4. Goals and objectives of current students.
5. Goals and objectives of former students (alumni).
6. Image of TEC among students and alumni (favorable/unfavorable?).
7. Retrospective and future needs as perceived by alumni.
8. Current needs as perceived by students.
9. Evaluations of present curriculum and instruction (in general).
10. Evaluations of past curriculum and instruction (from alumni).
11. Overall evaluations of current faculty and staff (from students).
12. Student awareness of various services and programs.
13. General and specific suggestions and recommendations.

● Faculty and Staff

1. Current and future personal and institutional needs as perceived by faculty and staff.

2. Internal perceptions of the success/failure of WVC/TSC in meeting institutional goals and objectives.
3. Internal evaluations of strengths/weaknesses of programs and services.
4. Internal perceptions of future needs.
5. Internal, self-evaluations of institutional performance (administration, organization, supervision, etc.)
6. Current overall evaluations of students.
7. Current overall perceptions of the needs of students.
8. Indicators of staff development and teacher training needs.
9. General and specific suggestions.

At times, the problem of collecting reliable and pertinent occupational data--as well as evaluative "feedback" from agencies and industries which employ skilled manpower--is made difficult by the following factors: changes within the business and industrial community, economic fluctuations, and the mobility of the population from which trained manpower might be selected. Moreover, when industrial growth within a service area is in a period of transition (e.g., expansion or decline) or in a state of "no-growth," many far-reaching implications are present for vocational and technical education. In essence, a needs assessment is an attempt to measure educational/occupational discrepancies insofar as existing, desired, required, or expected conditions are concerned. The general needs assessment is a systematic, disciplined, and rigorous process whereby investigators observe and measure existing internal and/or external conditions, usually by means of such research techniques as questionnaires, interviews, observations, or analyses of background information. Theoretically, these "measurements" will allow interpretations concerning important discrepancies that exist in an educational system. With valid and reliable data collected as a result of needs assessments, persons who make decisions about vocational and technical education can more accurately set levels of criticality, more soundly establish priorities, and more effectively allocate available resources.

4. PLANNING THE EMPLOYER NEEDS ASSESSMENT

Among the first tasks in planning an employer needs assessment project is the determination of specific purpose(s) of the research. Generally three broad research questions are inherent in employer needs assessments or in business/industry surveys. These questions are as follows:

1) How well does the educational institution (e.g., vocational or technical education center) respond to the occupational training needs of actual or potential clients in the service area (e.g., business, industries, public and private agencies, or other organizations and services)?

2) What are the occupational/employment trends of the institution's service area and how can the institution best respond to job needs associated with these trends?

3) What segments of the total manpower/employment force represent the jobs targeted for the needs assessment? In other words, the project director must define the educational level of persons within the work force who will be targeted in terms of job categories. If the needs assessment is conducted for or by a high school vocational education center, the population would most probably be defined as those persons in the work force whose educational level is beyond that normally provided on the job, comparable to that provided in a vocational high school, but less that that which requires a two-year technical degree or certificate. On the other hand, if the needs assessment is for a two-year technical, community, or junior college, the population would most likely be defined as those persons in the work force whose educational level is beyond that provided on the job, comparable to that provided in a two-year college, but less than that which requires a baccalaureate or higher degree. In addition, some needs assessment might focus on persons in the work force who require one-year training programs (or less), which lead to certificates, rather than to associate degrees. In any event, the director of an employer needs assessment project must be keenly aware of the nature of the targeted population before a meaningful survey can be planned. The <u>general population</u> to be surveyed will normally be comprised of many segments from the total manpower/employment force within the institution's service area. The <u>exact population</u> should be identified on the basis of jobs within the general population which, for entry-level positions, require training comparable to that offered by the institution(s) for whom the survey is being conducted.

5. RECOMMENDED STEPS FOR AN EMPLOYER NEEDS ASSESSMENT

<u>State the Research Problem</u>

- What is the overall purpose of the assessment and what is the primary research question or problem?

- What information is needed to properly address the research question or problem?
- Determine the kind of data needed from business and industry.

Identify the Nature of the Needed Data

- Research data will often consist of quantitative data (number of job accessions, separations, turnovers, unfilled jobs, etc.) and qualitative data (attitudes of employers toward graduates of available occupational education programs, evaluations of students who have completed programs, etc.)
- Persons who conduct business surveys must determine the exact nature of needed data, in terms of the purpose of the research.

Identify the General Population

- Based upon the research problem, determine the scope of the business and industrial community within the service area.
- How many and what size and kind of industries will be surveyed?

Identify Nature of Dependent and Independent Variables

Among additional factors, the dependent variables might consist of any or all of the following:

- Number of existing unfilled jobs for which occupational training is provided by the educational institution.
- Number of unfilled jobs for which training is needed but not provided by the educational institution.
- Number of permanent jobs anticipated at the end of a selected period of time (e.g., three years, five years, etc.).
- Attitudes of actual or potential employers toward occupational training.

The following are among the independent variables which pertain to many business/industry surveys:

- Type of business, industry or other agency/organization.
- Whether industry currently employs personnel who were trained at the educational institution.
- Whether agencies or organizations plan to employ personnel who were trained at the educational institution.
- Geographical location of businesses and industries (e.g., city, county, state, etc.).
- Skill expectations/needs of business and industry for critical occupational categories.
- Student-skill expectations of various educational programs offered by the educational institution.
- Size of the surveyed industry (based upon number of employees).

- Amount of weekly, monthly, annual, etc., payroll of each surveyed industry.
- Type of product manufactured by industries.
- Distance of industries from the educational center.

Collect Background Data About Service Area

- From available recorded materials, collect background information about the service area's population, education levels, geographic conditions, economic conditions, employment situation, etc., that could be used for an in-depth examination of the service area.
- A bibliography of possible sources of supplementary information is provided at the end of this manual.

Prepare Public Relations Releases

- Write articles about the survey for newspapers.
- Notify local TV and radio stations about the project.
- Distribute preliminary PR information about the project to the area's business and industrial community.
- Prepare cover letter to accompany mail questionnaire if necessary.

Develop the Frame

- Compile a master list (frame) of business and industrial organizations in the service area.
- Organize the frame by categories of industries, depending upon the purpose of the survey.

Develop the Questionnaire

- Decide upon the most effective data-gathering instrument(s) for the survey.
- Prepare the instruments--questionnaires, interview questions and schedules, and other data-gathering tools.

Train Research Assistants and Interviewers

- Select interviewers and research assistants.
- Provide training in interview techniques so that interviewers will be able to gather required data.
- Ensure that the interviewers clearly understand the research problem, the kinds of data needed, and the most effective means whereby the data might be collected.

Select Appropriate Samples

- Determine desired sample size.

- Stratify the population of industries according to an appropriate classification scheme.
- Draw a random representative sample of industries from the total population.

Administer the Survey

- Conduct interviews/distribute the mail questionnaire.
- Supervise data collection; spot-check work of information collectors.
- Gather data collected by interviewers and/or questionnaires.

Analyze Data and Process the Findings

- Tabulate the collected data.
- Analyze and interpret the collected data.
- Assess results of the survey in terms of the institution's enrollment, the planning of occupational-technical training programs, and the instruction of the institution.

Report Results of the Survey

- Prepare a written report of the survey, pointing out how, when, where, by whom, and with what results the research was conducted.
- Make recommendations for action.

6. POPULATIONS AND SAMPLES

The two most widely-used techniques for the conduct of employer needs assessments are based upon mail questionnaires and/or interviews with representatives of business and industry. These techniques are fundamental to survey research, which is distinguished by its reliance upon the selection of persons (or "units" of one kind or another) from large and small populations. Typically, the population targeted in an employer needs assessment is comprised of clientele within the business/industrial community served by an institution that offers vocational/technical programs. In the context of survey research, a population is any group of persons, institutions, or other units that possess at least one common characteristic. Survey research methods enable persons who conduct employer needs assessments to gather required data without having to

conduct complete enumerations of all businesses and industries. These surveys can save time and money without sacrificing efficiency, accuracy, or information adequacy.

Some Questions Related to Sample Selection

- Will <u>all</u> firms be surveyed or should the frame be limited to those that employ 25, 50, etc. or more persons?
- Should all large firms be interviewed on-site and then should small firms be surveyed by mail questionnaires?
- Are qualified or trainable interviewers available for on-site interviews with representatives of firms
- To promote better public relations within the institution's clientele, should all major firms be interviewed on-site?
- Is the population too large for a complete enumeration of all firms?
- How much time is available for the survey?
- How much financial support is available?
- Are units that comprise the population spread over a large or small area?
- How much diversity is inherent in the population? (e.g., degree of homogeneity or heterogenity among the various firms)

Randomness and Representativeness

When complete enumerations are not conducted, the most reliable and valid results can be obtained from <u>random</u> and <u>representative</u> samples--that is, each member of the population is given an equal chance of being chosen, and the sample is matched with population characteristics (variables) deemed to be important in a particular business/industry survey. Most samples need not be very large; the accuracy of survey data for needs assessments, as in other kinds of survey research, is not a function merely of sample size. Random sampling in business/industry surveys can greatly reduce the number of respondents (cases) to be dealt with. In addition, because the sampling technique is based upon the laws of chance, the variety included within a population can be better represented than the same number of cases chosen deliberately. Moreover, biased selection is eliminated by random sampling, which is based upon the following principles: the population and the units that comprise the population should be clearly

defined; 2) each unit subject to being selected should have an equal chance of being chosen; 3) units within the population must be independent so that the selection of one unit will not affect the choice of another; 4) sample selection techniques should not be based upon factors to be examined (the dependent variables); and 5) all units selected must be accessible as respondents/subjects.

Essentially there are three types of stratified samples: 1) proportional stratified samples (each unit from each stratum is selected in proportion to the unit's occurance within the universe); 2) disportional stratified sample (an equal number of units are drawn from each stratum of the population); and 3) stratified weighted sample (average from random samples are weighted for each stratum). When samples are stratified according to variables, the stratification factors should be pertinent to the dependent variable (object or topic of investigation). In addition, each stratum should possess internal homogeneity (e.g., be mutually exclusive, insofar as possible). Stratification variables must be clearly defined, and information available to investigators concerning the variables must be accurate, complete, and accessible.

Suppose that a technical college is attempting to determine attitudes of personnel officers toward TEC-trained employees (in the institution's service area). A scale could be carefully developed that would measure attitudes in the form of scores extending along a continuum from favorable to unfavorable. Because the population of personnnel directors in this example totals 200 persons, the assessment project director might make a decision that all members of the population will not be surveyed. Instead, a completely random sample of 30 personnel directors will be selected; the attitude scale (test) is then administered to all persons chosen to represent the target population. The mean attitude score of personnel directors comprising the sample would be the

best estimate of the population mean available from the sample.

A sample of business and industries which resembles the pertinent characteristics of the targeted or parent population is said to be representative. Thus, the degree of heterogeneity, or dissimilarity, inherent in the local business and industrial community can be used as a guide to determine the nature and size of a sample. When the target population is comprised of a variety of kinds of firms and agencies (that is, when the population is heterogeneous), the greater will be the variability among several samples selected from that population, all other things being equal. For example, a population of 200 business and industrial firms that are very different (diversified) could be characterized as possessing variability. Should the types of industries be more-or-less equally distributed in the target population, various selected samples could also be expected to have variability. However, should the population be comprised primarily of one or a few types of manufacturing firms, with small representations from other kinds of industries, samples drawn from this more homogeneous group could be expected to be more constant. Typically, the target populations for most employer needs assessments are comprised of a variety of business and industries.

The selection of a random sample in business/industry surveys can be accomplished with the following steps:

1. Compilation of a master list of firms from available industrial and business directories, from yellow pages of telephone directories, from city and county directories, and from additional prepared lists. The most useful sources for compiling a master list are those that include the number of persons employed in firms, as well as the names and addresses of personnel directors. For example, within South Carolina, the most current edition of the South Carolina Industrial Directory represent the most complete list. Industries are categorized in this directory according to SIC. Furthermore the directory indicates the total number of male and female employees; it also provides addresses.

2. Stratification of the master list of firms according to an appropriate

classification scheme, e.g., SIC categories obtained from the Standard Industrial Classification Manual.

3. Determination of the appropriate size of the random sample (e.g., 15 percent, 20 percent, 30 percent, etc.) selected from among all firms listed in the frame.

4. Actual choosing of a representative, random sample of firms to be surveyed by means of mail questionnaires or by face-to-face, on-site interviews.

7. STRATIFICATION OF SAMPLES

Stratification and random selection techniques can be used to decrease variability among different sets of population members, e.g., groups of industries. When the surveyor wants to ensure that all homogeneous business/industry groups are properly represented in a sample, the sampling technique can then be refined. Stratification is a refinement of the sampling process whereby the population is divided into strata that are homogeneous. In addition, the sampling concept of randomness can be used. When random samples are selected, each business/industry in the target population is given an equal chance of being chosen.

While some circumstances preclude the selection of random samples in various needs assessments (e.g., when the object of a business/industry survey is to locate specific industries), surveyors cannot generalize data (make inferences) from nonrandom samples. For example, all radio and television stations, or all hospitals, or all water treatment plants within a service area could be surveyed for the purpose of conducting a narrowly-focused study of needs within specific occupational categories or industries. At times only certain data might be available from a unique business or industry--e.g., from a nuclear power station. However, needs assessment data must originate from randomly selected samples if investigators plan to make inferences regarding parent populations--unless, of course, a complete enumeration of the population is

SELECTION OF STRATIFIED RANDOM SAMPLES OF VARIOUS SIZES FROM AMONG MAJOR INDUSTRIES OF A FOUR-COUNTY AREA SERVED BY AN EDUCATIONAL INSTITUTION

(Industries Grouped by Standard Industrial Classification Code)

			A	B	C	D
SIC Code	Type of Industry	Number in Category	Percent of all Industries	15% Sample	20% Sample	30% Sample
2011	Meat Packing Plants	8	5	1	2	3
2033	Canned Fruits & Vegetables	5	3	1	1	2
2051	Bread & Related Products	7	4	1	1	2
2086	Bottled & Canned Drinks	14	8	2	3	4
2091	Canned & Cured Fish & Seafood	3	2	0	1	1
2211	Weaving Mills, Cotton	22	13	3	4	6
2241	Narrow Fabric Mills	6	4	1	1	2
2262	Finishing Plants, Synthetic	5	3	1	1	2
2329	Men's & Boy's Clothing	4	2	1	1	1
2396	Automotive & Apparel Trimmings	3	2	0	1	1
2421	Sawmills & Planning Mills	8	5	1	2	3
2435	Hardboard Veneer & Plywood	2	1	0	0	0
2621	Paper Mills	7	4	1	1	2
2752	Printing: Lithographic	5	3	1	1	2
2851	Paints & Allied Products	15	9	2	3	4
3271	Concrete Block & Brick	7	4	1	1	2
3317	Steel Pipe & Tubes	4	2	1	1	1
3444	Sheet Metal Work	12	7	2	2	3
3552	Textile Machinery	15	10	3	3	5
3621	Motors & Generators	5	3	1	1	1
3949	Sporting & Athletic Goods	10	6	1	2	3
	TOTALS	167	100	25	33	50

EXAMPLE OF A METHOD OF SELECTING A STRATIFIED RANDOM SAMPLE FOR A BUSINESS/INDUSTRY SURVEY OR EMPLOYER NEEDS ASSESSMENT

Step One: Group all industries into appropriate categories according to types of firms or products manufactured. (Often, the Standard Industrial Classification (SIC) is used to group industries.) Next, count the total number of industries included in each classification category and enter these data into the "Number in Category" column shown in the table above.

Step Two: To determine the percents of all industries included within each of the classification categories (for column A, above), divide the number of industries within each SIC code area by the total number of industries in the population (in this case, N = 167) (e.g., 8 industries were classed within SIC 2011, above; therefore, 8/167 = .05; 5/167 = .03; 7/167 = .04, etc.)

Step Three: To determine the actual number of various types of industries to be included in the sample (for column B, C, or D, depending upon the size of the sample), multiply the sample size percentage by the total number of industries (N = 167). For example, if the sample size is to be 15 percent, multiply 167 x .15 = 25; if the sample size is to be 20 percent, multiply 167 x .20 = 33; and if the sample size is to be 30 percent, multiply 167 x .30 = 50.

Step Four: Divide the percentages determined for column A, etc., by the total number of industries to be included in the sample, e.g., 5/25 = 1; 5/33 = 2; and 5/50 = 3.

Step Five: Once the sample size and the number of firms from each Standard Industrial Classification category have been determined, randomly select the desired number of industries from each category.

accomplished among all industries within the service area, or unless the needs assessment will focus upon a single type of industry, all of which will be surveyed.

The refinement of sampling techniques so that the selected businesses and industries are representative of the whole can allow investigators to reduce the needs assessment sample size. For example, the universe (all firms in the area) can be categorized into homogeneous strata such as, for example, categories of the Standard Industrial Classification (SIC), or according to other pertinent variables such as the number of employees within the industries or the county or city in which industries are located. Then, a simple random sample can be selected from each stratum (i.e., from each SIC category, or from each number-of-employees bracket, or from each county or city). To enhance the representativeness of collected data, the units (industries) chosen from each stratum can be selected in proportion to their actual distribution within the population. Thus, if 40 percent of local firms could be classified as textile industries, then 40 percent of the units selected in the sample should also be from textiles. Stratification is unnecessary when there is insufficient reason to anticipate degrees of variation in data collected from among or between groups of industries. In addition, the selection of samples should hinge upon a statistical probability model that is designed to allow the identification of tolerable errors ("confidence limits"). Furthermore, factors such as the accessibility of respondents within business and industry, the specific purpose of the needs assessment, time constraints, or available financial support may also govern sampling procedures in needs assessments.

Competent project directors plan and prepare carefully for the conduct of effective survey research projects. Exploratory questions and the purposes

of the survey are identified explicitly, along with the nature and extent of the population to be surveyed. Moreover, the type and size of the sample is determined, and procedures or instruments such as interviews and questionnaires are devised so that relevant information can be collected from business and industry. Data-gathering instruments are also carefully designed, precoded, and pretested. Finally, logical matters are planned, including procedures for the distribution of questionnaires or for interview sessions, for the tabulation and scoring of instruments by research assistants, and for the processing of research data. For some business/industry surveys--particularly those with financial sponsorships--estimates of costs must also be determined and reported.

8. DATA-GATHERING INSTRUMENTS

A commonly used data-gathering instrument in business/industry surveys is the mail questionnaire. Once these instruments are properly designed and carefully pretested, they are usually duplicated in one form or another and mailed to respondents in business and industry (often personnel officers) who have been randomly selected from a frame, which is directory, roster, or other list of members of the target population. Mail questionnaires have both advantages and disadvantages, all of which ought to be weighed carefully by needs assessment project directors. Questionnaires allow a considerable range and distribution of the sample, providing an opportunity for respondents in business and industry to give frank, anonymous answers to questions posed. Economy of effort and the potential to collect larger amounts of data are offered by the mail questionnaire in comparison to face-to-face interviews with respondents. In addition, the preparation of a written instrument often requires the careful conceptualization and planning of the business survey--

and of the data-gathering instrument itself. Because of their fixed forms, questionnaires can be more stable research tools than interviews.

On the other hand, weaknesses of questionnaires should not be overlooked. A written instrument distributed through the mail can decrease or preclude personal contact between respondents and research workers. These instruments do not provide an opportunity for some investigators to adequately explain questions or for respondents to qualify unclear items. Nonresponse bias might also result in mail surveys having low return rates. Furthermore, verification of questionnaire data is often difficult, and a printed instrument might not provide an opportunity to adequately measure relationships between various independent variables and respondents' actions, opinions, attitudes, or factual data (dependent variables).

Questions prepared for mail business surveys can be classed into two broad categories: structured and unstructured. Structured questions are multiple-choice type items, or they may have other forms of guided responses. The "best" or "most appropriate" response is typically chosen by respondents, depending upon their personal judgments. The following items are examples of structured questions:

A. Looking into the future (to about 1985), what do you feel the overall job opportunities in your company will be for employees who have received various kinds of training offered by area vocational schools or technical education centers? (Please check one.)

O very good O stable O very poor
O good O poor O uncertain

B. If your firm has employed applicants who were trained at Smallwood Vocational and Technical College, what has been your primary source for their identification and eventual employment? (Please check one.)

O Employment Agency
O T&C faculty member

- ○ TEC industrial representative
- ○ TEC placement office
- ○ Mutual acquaintance
- ○ Published want-ad (e.g., in newspaper)
- ○ Initiative of the applicant/employee
- ○ Other (specify): _____

C. The minimum educational level required for the majority of the job positions within your industry is:

- ____ Elementary school
- ____ General high school
- ____ Vocational high school
- ____ Junior, Community or Technical College
- ____ Four-year college
- ____ Beyond four years of college

D. Within your business or industry what occupations/jobs might be phased out or substantially curtailed in the next five years?

E. If your company has hired personnel who received vocational or technical training at Smallwood Vocational and Technical College and was not completely satisfied with the training of these individuals, how do you feel it could have been improved?

F. What are some of the most serious future employment problems that you foresee for your business or industry?

G. If your company plans a future expansion, please describe the nature of the expansion and the impact that it is likely to have on employment in your firm.

Some factual type questions are listed below:

1. How many full-time and part-time persons does your firm currently employ?

   Total full-time employees _____
   Total part-time employees _____

2. Does your business or industry conduct any in-house employee educational programs? Yes _____ No _____

   If answer is Yes, please briefly describe the program(s).

   _____

   _____

3. In general, how well do you feel Trojan Technical College is serving the community?

   - ○ Have no knowledge of
   - ○ Less than adequately

○ Adequately
○ More than adequately
○ Occasionally

4. Are there specific kinds of training that Wayne Technical College could offer that are not presently being offered but which would provide knowledge and skills needed by your employees?

Yes _____ No _____

If yes, please specify what additional kind of useful training the institution could provide. _____

_____

5. Do you have (a) some _____, (b) much _____, (c) little _____ (d) no _____ difficulty in hiring qualified employees?

6. Please check the technical specialization(s) that are offered by Tri-State Technical College which you feel could help meet existing or future employment needs at your radio or television station.

_____ General announcer
_____ Newsman
_____ Sports announcer
_____ Copywriter
_____ Promotion
_____ TV cameraman
_____ Film cameraman
_____ Salesman
_____ Traffic director
_____ Engineer (describe)
_____

7. What does your business or industry consider to be the major, pre-job-entry training needs for the majority of the jobs?

8. Would you like to schedule in-house training programs for your employees through Pinemont College?

Yes _____ No _____

If yes, please specify: _____

_____

9. Please indicate the number of your current employees who have received diplomas or degrees from a vocational or technical education institution.

Number of Employees with diplomas (one year) _____
Number of Employees with associate degrees (two years) _____

10. To what extent has your firm received applicants from persons who appear to be over-qualified? Please explain.

11. Within your business/industry, what occupations do you expect to be phased out during the next two-year period and how many jobs will be affected? Please explain.

In contrast to responses to unstructured questions, replies to structured questions are usually easier to tabulate, to characterize, and to analyze. However, structured questions can force persons to select a response that does not accurately represent their personal views or feelings. Thus, project directors should take care to ensure that structured questions are followed by a sufficient number of fixed responses that reflect the spectrum of attitudes, beliefs, opinions, or views surrounding the topic being scrutinized. Structured questions should be provided with fixed responses that range from the most positive to the most negative statement, also often including a neutral position with as "don't know" or "undecided." Fixed responses are often precoded or scaled; this is accomplished by assigning appropriate numerical weights to each response choice. Values assigned to fixed responses are based upon the judgments of experts, upon established principles, or upon prior knowledge and research.

The following are samples to occupational inventory checklists:

AREA: Industrial Production

JOB CATEGORY: Machining Occupations

INSTRUCTIONS: Please provide requested information by filling the appropriate blanks.

1. All-Round Machinists

   Permanent positions 3 years ago _____

   Permanent positions now _____

   Estimated permanent positions _____

   Separations (past 90 days) _____

   Accessions (last 90 days) _____

   Number of separations leaving the field _____
   (true turnover)

   Number of unfilled jobs (actively seeking employment) _____

2. Machine Tool Operators

   Permanent positions 3 years ago _____

   Permanent positions now _____

   Estimated permanent positions _____

   Separations (past 90 days) _____

   Accessions (last 90 days) _____

   Number of separations leaving the field (true turnover) _____

   Number of unfilled jobs (actively seeking employment) _____

3. Set-Up Workers (Machine Tool)

   Permanent positions 3 years ago _____

   Permanent positions now _____

   Estimated permanent positions _____

   Separations (past 90 days) _____

Accessions (last 90 days) _____

Number of separations leaving the field (true turnover) _____

Number of unfilled jobs (actively seeking employment) _____

4. Tool-and-Die Makers

Permanent positions 3 years ago _____

Permanent positions now _____

Estimated permanent positions _____

Separations (past 90 days) _____

Accessions (last 90 days) _____

Number of separations leaving the field (true turnover) _____

Number of unfilled jobs (actively seeking employment) _____

● J O B M A R K E T I N V E N T O R Y

CLERICAL OCCUPATIONS	Average number of days job is vacant	Local supply of trained manpower (check appropriate category)			Annual starting salary
		Surplus	Sufficient	Shortage	
Bookkeeping Workers					
Cashiers					
File Clerks					
Office Machines Oper.					
Receptionists					
Shipping & Rec. Clerks					
Stenos. & Secretaries					
Stock Clerks					
Typists					
Other (specify)					

In what educational program areas and at what level of TEC support do you see the need for additional assistance to meet the needs of the personnel employed by your firm or industry? (Please list educational programs and check corresponding level of desired TEC support).

EDUCATIONAL PROGRAM AREAS ↓	DESIRED TYPES OF TEC SUPPORT				
	In-Service upgrading	Specialized courses	Certificate or degree program	Workshops	Institutes
Electronics (example)			X	X	
1.					
2.					
3.					

Please indicate your evaluations of past and present TEC-trained personnel employed by your firm or industry by placing check marks at appropriate points along the following scales:

QUALITIES ↓ ↓	EVALUATIONS					
	Very Poor	Poor	Satisfactory	Good	Very Good	Don't Know
Overall quality of work						
Following instructions						
Accepting responsibility						
Punctuality						
Work attendance						
Willingness to learn						
Cooperation with co-workers						
Cooperation with management						
Attitudes toward work						
Personal appearance						
Compliance with policies						
Others (specify):						

The following list contains technical and vocational skills and competencies which your firm or industry may or may not expect on the part of TEC-trained or vocationally trained personnel as a whole. Please examine the list carefully and check the needed level of expertise (5 = needed most; 1 = needed least).

	Needed least ①	②	Moderately needed ③	④	Needed most ⑤
Mathematical skills					
Technical skills					
General knowledge					
Organizational ability					
Communication skills (writing & speaking)					
Problem-solving skills					
Manual dexterity					
Meeting the public					
Understanding of human relations					
Operation of complex equipment					
Knowledge of chemistry					
Knowledge of physics					
Knowledge of biology					
Knowledge of psychology					
Knowledge of electronics					
(Please list others below)					

9. TRAINING INTERVIEWERS TO COLLECT INFORMATION

Training is usually necessary to prepare research assistants to perform data-collection tasks. Trainees should receive a thorough orientation about the particular nature of the employer needs assessment in which they will participate, as well as the kinds of data needed and the specific requirements of their jobs as data collectors. Interviewers should also be allowed an adequate period of time in which to become very familiar with the data-collection instruments--e.g., questionnaires, interview schedules, and reporting forms--on which they will record and communicate collected information.

Moreover, as a part of their training, data collectors ought to be given an opportunity to become very familiar with the overall goals and objectives of the educational institution for which the needs assessment will be conducted. Copies of school catalogs, bulletins, and other materials which explain the institution's goals, objectives, and educational programs should be given to--and studied--by all interviewers. Practice interview sessions should also be held. In these "dry-runs" or role-playing sessions trainees can learn to cope with both typical and atypical interviewing problems.

Because interview sessions are often very unpredictable events, data collectors should be trained to deal with a variety of potential interviewing problems. Thus, training sessions can be very helpful because they give interviewers an excellent chance to review data-collection instruments and schedules and to learn how to properly record needed information. Clear directions for the collection of required information can be given in training sessions. Moreover, interviewers must be instructed how to establish contact and arrange meetings with representatives of business and industry. Because some interviewers may not be very familiar with the institution for

which an assessment is being undertaken, these research assistants should be given instructions about how to refer questions or problems which they cannot answer to persons who can deal with such matters quickly and effectively.

Qualified interviewers are often able to elicit valuable, original evidence--both from what persons say and what they do not say. Interviewers must be adequately trained so that they are very well prepared for all required interrogative aspects of needs assessments.

Most successful interviews are conducted in an informal and friendly manner. Successful interviews are more likely to take place when both the interviewer and the respondent are at ease. Each representative serving as a respondent from business or industry must be approached as an individual. Respondents should be asked to answer only one question at a time, rather than several subquestions combined into a complex query. It is important for data collectors to remain aware that personnel officers or other business/industrial representatives are typically very busy individuals. Therefore, at the scheduled time of the appointment the interviewer should appear promptly and should not waste the respondent's valuable time by conducting unnecessarily long interview sessions.

Interviewers should not attempt to put words into respondent's mouths. Neither should they show shock, disbelief, or dismay in relation to respondent's replies. Comments obtained in interview sessions must be recorded objectively so that the provided information will be accurate. Interviewers must remain keenly aware that their task is to elicit and record the actual replies of respondents. Furthermore, interviewers must keep in mind that all information provided to them is confidential and will not be passed on to persons other

than those involved in the project. In the final analysis, the purpose of employer needs assessment interviews is to obtain information from business/industry representatives--not the personal attitudes and opinions of the data collectors.

SUGGESTED CRITERIA FOR THE SELECTION OF INTERVIEWERS AND OTHER INFORMATION COLLECTORS

- a current and valid driver's license and a dependable automobile
- preferably a BA or BS degree, but at least a junior college degree
- background in education or in an appropriate area of the social or behavioral sciences
- experience in vocational or technical education (either as a teacher or administrator)
- friendly and personable disposition
- appropriate dress and behavior
- ability to work during required hours
- ability to follow directions
- ability to record respondents' comments in an objective and accurate manner
- sound and practical judgment

10. QUANTIFICATION AND ORGANIZATION OF DATA

The quantification of survey research data is the process whereby written or oral replies of respondents are assigned numerical values that reflect, in a meaningful way, the nature of the collected information and that facilitate the recording, storage, analysis, and retrieval of data. Some data can be readily quantified. Others can be assigned numerical weights only with careful attention to scaling techniques. Some information can be quantified only by counting the number of times in which its individual components ("bits") fall within categories that have been carefully established by research workers. Careful planning on the part of needs assessment project directors is necessary if a business/industry survey is to entail the collection and analysis of valid and reliable quantified data. Thus, the preparation of data-collection instruments for needs assessments is a major activity that should be given the most scrupulous attention long before data collection actually begins. Perhaps some examples of the use of quantification would be helpful at this point.

Suppose that part of an employer needs assessment will involve the collection of information concerning the attitudes and opinions of employers about employees who have received certain types of vocational/technical training. A carefully constructed attitude scale could be made part of the questionniare or interview schedule. By means of fixed response alternatives to certain questionnaire items, surveyors could quantitatively measure how business/industry regards the training offered by an institution. Thus, such weighted response-alternative items as the following might be devised:

(1) How would you rate the overall quality of courses offered at Westberry Technical College?

	Weight
☐ Excellent	5

☐ Good	4
☐ Fair	3
☐ Rather Poor	2
☐ Very poor	1

(2) In your opinion, to what extent has Westberry Technical College benefited the business/industrial community within its service area?

	Weight
☐ It has been very beneficial	5
☐ It has been beneficial	4
☐ It has been somewhat beneficial	3
☐ Essentially, it has been unbeneficial	2
☐ It has been very unbeneficial	1

(3) In your opinion, how well is Westberry Technical College integrated into its community?

	Weight
○ To a great degree	5
○ To a moderate degree	4
○ To a satisfactory degree	3
○ To a limited degree	2
○ Not at all	1

(4) To what extent do you feel that private business and industry have been involved in planning, developing, and evaluating Westberry Technical College's educational programs?

	Weight
○ Very involved	5
○ Fairly-well involved	4
○ Moderately involved	3
○ Marginally involved	2
○ Not at all involved	1

When such groups of items as the above are scored (based upon the assigned weights of selected response alternatives) attitude scores of each survey participant can be summated and then averaged (e.g., divided by the total number of items)--a process that produces a summated rating (overall attitude score of a respondent). In the example just presented, the higher the respondent's score, the more favorably his/her views are toward the institution (the attitude object).

Also, suppose that a market analysis of employment opportunities for engineering and science technicians is being made. The research project is aimed at predicting needs within the next five-year period in 15 plastics manufacturing firms; thus, the dependent variable of the survey would be the number of job openings within the targeted occupational category. The investigator is faced with the decision of whether to attempt to provide qualitative or quantitative indicators of whether the percent of relevant job openings in these firms will increase, remain steady, or decline. Since the quantitative approach to this problem will produce more valuable information--as opposed to the qualitative approach which would probably utilize only such descriptions as "slow", "rapid", "moderate", etc.--the following quantification scale could be devised and used to more rigorously characterize job openings.

Qualitative Values (Change in Job Market)	Quantitative Values (Percent of Increase or Decline)
☐ Very rapid	40.0 or more
☐ Rapid	30.0 - 39.9
☐ Moderate	15.0 - 29.9
☐ Slow	5.0 - 14.9
☐ Little or no change	0.0 - 4.9

Therefore, instead of merely reporting that in the local job market opportunities for engineering and science technicians plastics will be "moderate", we can state that the growth in the targeted occupational category is expected to be 19 percent, for example. Thus, if a total of 49 engineers and science technicians work in local plastics firms, we could expect an increase of 9 jobs within this occupational category.

12. SUMMARY

Employer needs assessments can reveal new and discrepant expectations of the business/industrial community for the institution's services and programs. These assessments can also increase constructive involvement of the business/industrial community in the institutional planning process. Furthermore, different perceptions of the college image and mission might be revealed, and measureable criteria for the evaluation of educational programs, projects, and services might be provided by employer needs assessments. Some of these assessments can also provide data for specific program development, modification, reduction, or elimination, as well as for modification of the institution's mission. Other benefits of employer needs assessments might include the identification of institutional priorities for planning purposes, the provision of a realistic basis for the allocation of institutional resources based upon need priorities, and the enhancement of the development of valid priorities, objectives, and goals for the educational institution.

In the final analysis, the conduct by an educational institution of a business/industry survey allows the collection of both quantitative data for job market analyses and qualitative data for the improvement of instruction and the institutions relationship with its community. Considerable planning and preparation are necessary to carry out a successful needs assessment. This manual was prepared as a guide to the planning and conduct of an employer needs assessment. Some of the major considerations in these assessments have been discussed here, and it is hoped that the material presented will be useful. A bibliography of additional sources of information is provided on pages 35-37.

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Suggested Initial Letter to Businesses/Industries

June 1, 1979

Mr. John Q. Smith, Personnel Officer
XYZ Manufacturing Company
Anytown, U. S. A.

Dear Mr. Smith:

During the coming months, (Institution's name) will be conducting an Employer Needs Assessment Project to determine both quantitative and qualitative employment needs of business and industry in the institution's service area. This project is being made possible through a grant from the (Name of financial sponsor).

As a result of our planned survey, we hope to be able to more accurately determine whether discrepancies exist between vocational and technical training needs of our service area and the educational programs at (Institution's name) that are designed to meet these needs. Therefore, the co-operation of selected representatives from business and industry will be of considerable value to us here at (Institution's name) as we attempt to upgrade and revise our educational programs. Your participation in the forthcoming survey can do much to help us accomplish this goal, and it can also be of considerable benefit to your firm in the long run.

Planning for the study has been underway for several weeks, and (Name of project director) has been appointed project director. If you agree to participate with us in this survey of business and industry and will designate a representative who is very familiar with your employment and training needs and who can serve as a contact person, we will be getting in touch with her/him in the near future. A self-addressed, stamped post card is enclosed for your use in letting us know the name of your designated representative.

Thank you very much for your attention to this request. We look forward to your firms' participation in this worthwhile project.

Sincerely,

Sam O. Jones

Samuel O. Jones
President

Appendix II, Selected Occupations and Their Characterisitcs, was deleted because of irreproducibility before the document's submission to the ERIC Document Reproduction Service.

OCCUPATIONAL INVENTORY CHECKLIST

CONFIDENTIAL

EMPLOYER NEEDS ASSESSMENT PROJECT

Tri-County Technical College
Pendleton, S.C.

FIRM OR INDUSTRY: _____ SIC: _____ DATE: _____

ADDRESS: _____ TELEPHONE: _____ REPRESENTATIVE'S NAME: _____
(street) (city) (state) (zip)

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
INDUSTRIAL PRODUCTION												
Foundry Occupations:												
Coremen												
Molders												
Patternmakers												
Machining Occupations:												
All-Round Machinists												
Instrument Makers (mechanical)												

APPENDIX III

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Machine Tool Operators												
Set-up Workers (machine tools)												
Tool-and-die Makers												
Printing Occupations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Bookbinders and Related Workers												
Composing Room Occupations												
Electrotypers and Stereotypers												
Lithographic Occupations												
Photoengravers												
Printing Pressmen												
Other Industrial and Related Occupations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Automobile Painters												
Blacksmiths												

(3)

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Boilermaking Occupations												
Electroplaters												
Foremen												
Furniture Upholsterers												
Millwrights												
Motion Picture Projectionists												
Photographic Laboratory Occupations												
Stationary Engineers												
Stationary Firemen												
Wastewater Treatment Plant Operators (Sewage)												
Welders and Flame-cutters												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1965 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
OFFICE OCCUPATIONS												
Clerical Jobs:												
Bookkeeping Workers												
Cashiers												
File Clerks												
Hotel Front Office Clerks												
Office Machine Operators												
Postal Clerks												
Receptionists												
Shipping and Receiving Clerks												
Stenographers and Secretaries												
Stock Clerks												
Typists												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED WORKERS (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE YEARS PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Computer and Related Occupations	↓	↓	↓	✓	↓	-	↓	↓	↓	↓	↓	↓
Programmers												
Systems Analysts												
Banking Occupations	↓	↓	↓	✓	✓	✓	↓	↓	↓	↓	↓	↓
Bank Clerks												
Bank Tellers												
Insurance Occupations	↓	↓	↓	✓	↓	✓	↓	↓	↓	↓	↓	↓
Claims Adjusters												
Claim Examiners												
Administrative and Related Occupations	↓	↓	↓	↓	↓	-	↓	↓	↓	↓	↓	↓
Advertising Workers												
Credit Officials												
Hotel Managers & Assistants												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
SERVICE OCCUPATIONS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Bartenders												
Cooks & Chefs												
Meatcutters												
Barbers												
Cosmetologists												
Funeral Directors												
Firefighters												
Police Officers												
State Police Officers												
SALES OCCUPATIONS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Automobile Salesworkers												
Automobile Service Advisors												
Insurance Agents & Brokers												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	Surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Real Estate Sales-workers & Brokers												
Retail Trade Sales-workers												
Construction	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
Asbestos and Insulating Workers												
Bricklayers												
Carpenters												
Cement Masons(Cement & Concrete Finishers)												
Electricians (Construction)												
Floor Covering Installers												
Glaziers												
Lathers												
Operating Engineers (Construction Mach. Operators)												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	surplus	sufficient	shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Printing and Paperhangers												
Plasterers												
Plumbers and Pipefitters												
Roofers												
Sheet-metal Workers												
Stonemasons												
Structural, Ornamental, and Reinforcing iron workers, riggers, and machine movers												
Occupations in Transportation Activities	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Air traffic controllers												
Aircraft mechanics												
Flight Attendants												
Flight Engineers												

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OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (check one)			NUMBER OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADDITIONAL FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROXIMATE NUMBER OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT FIVE-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED TO FILL A JOB IN YOUR FIRM WITHIN THE CATEGORY?		
	SURPLUS	SUFFICIENT	SHORTAGE				INCREASE	REMAIN CONSTANT	DECREASE	YES	NO	DON'T KNOW
Ground Radio Operators and Teletypists												
Pilots and Copilots												
Traffic Agents and Clerks												
Locomotive Engineers												
Locomotive Firemen (Helpers)												
Scientific and Technical Occupations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Broadcasting Technicians												
Drafters												
Engineering and Science Technicians												
Food Processing Technicians												
Surveyors												
Mechanics and Repairers	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

OCCUPATIONAL CATEGORIES	Local Supply of Trained Manpower (Check One)			# of Persons Currently Employed in Occupational Category Who Do Not Have Minimum Certification or Education Needed for the Job	Add'l Full-Time Personnel Needed to Provide Optimum Care for Present Service Level	Approx. # of Personnel Needed by July 1985 for Anticipated Service Level	Within the Next 5-Year Period, the Scope of Work for the Job is Expected to:			Has a TEC-Trained Person ever Been Employed in Your Firm Within the Category?		
	Surplus	Sufficient	Shortage				Increase	Remain Constant	Decrease	Yes	No	Don't Know
Telephone Central Office Craft Occupations												
Telephone Line Installers and Cable Splicers												
Automobile Body Repairers												
Automobile Mechanics												
Business Machine Mechanics												
Diesel Mechanics												
Dispensing Opticians and Optical Technicians												
Farm Equipment Mechanics												
Industrial Machinery Repairers												
Instrument Repairers												
Jewelers and Jewelry Repairers												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (CHECK ONE)			# OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADD'L FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROX. # OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT 5-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED IN YOUR FIRM WITHIN THE CATEGORY?		
	Surplus	Sufficient	Shortage				INCREASE	REMAIN CONSTANT	DECREASE	YES	NO	DON'T KNOW
Maintenance Electricians												
Piano and Organ Tuners and Repairers												
Television and Radio Service Technicians												
Truck and Bus Mechanics												
Watch Repairers												
Health Occupations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Dental Laboratory Technicians												
Medical Assistants												
Medical Laboratory Workers												
Operating Room Technicians												
Optometric Assistants												
Respiratory Therapists												

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (CHECK ONE)			# of PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADD'L FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROX. # OF PERSONNEL NEEDED BY JULY 19[illegible] FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT 5-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED IN YOUR FIRM WITHIN THIS CATEGORY?		
	Surplus	Sufficient	Shortage				Increase	Remain Constant	Decrease	YES	NO	DON'T KNOW
Licensed Practical Nurses												
Occupational Therapy Assistants												
Art, Design, and Communications-Related Occupations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Display workers												
Photographers												
Radio and Television Announcers												
Other:	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

OCCUPATIONAL CATEGORIES	LOCAL SUPPLY OF TRAINED MANPOWER (CHECK ONE)			# OF PERSONS CURRENTLY EMPLOYED IN OCCUPATIONAL CATEGORY WHO DO NOT HAVE MINIMUM CERTIFICATION OR EDUCATION NEEDED FOR THE JOB	ADD'L FULL-TIME PERSONNEL NEEDED TO PROVIDE OPTIMUM CARE FOR PRESENT SERVICE LEVEL	APPROX. # OF PERSONNEL NEEDED BY JULY 1985 FOR ANTICIPATED SERVICE LEVEL	WITHIN THE NEXT 5-YEAR PERIOD, THE SCOPE OF WORK FOR THE JOB IS EXPECTED TO:			HAS A TEC-TRAINED PERSON EVER BEEN EMPLOYED IN YOUR FIRM WITHIN THE CATEGORY?		
	Surplus	Sufficient	Shortage				INCREASE	REMAIN CONSTANT	DECREASE	YES	NO	DON'T KNOW
OTHER:												

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